

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of: LUC MOENS <i>et al.</i>	Confirmation No.: 8632
Application No.: 10/544,116	Examiner: Listvoyb, Gregory
Filed: October 4, 2005	Group Art Unit: 1765

For: THERMOSETTING POWDER COMPOSITIONS FOR COATINGS

Commissioner for Patents  
Alexandria, VA 22313-1450

**APPEAL BRIEF**

Dear Sir:

This Appeal Brief is submitted in support of the Notice of Appeal dated January 18, 2011.

**I. REAL PARTY IN INTEREST**

CYTEC SURFACE SPECIALTIES, S.A. is the real party in interest.

**II. RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any related Appeal or Interference.

**III. STATUS OF THE CLAIMS**

Claims 29 through 41 are pending in this Application. Claims 1 through 28 and 42 have been canceled; and claims 29 through 41 have been previously presented.

The claims have been rejected no less than three times, the most recent rejection appearing in the Office Action dated October 22, 2010. It is from the most recent rejection in the Office Action dated October 22, 2010 that this Appeal is taken.

#### IV. STATUS OF AMENDMENTS

No Amendment has been filed subsequent to the issuance of the October 22, 2010 Office Action.

#### V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The present invention stems from the discovery that good coating flexibility of an isophthalic acid-rich amorphous polyester composition can be unexpectedly obtained when a specific selection of polyols is incorporated in the composition.

Independent claim 29 reads as follows:

29. A powdered thermosetting composition (see e.g., line 33, page 3 - line 4, page 4; and line 32, page 5) comprising:

- a) a carboxyl functional amorphous polyester having an acid number from 12 to 34 mg KOH/g (see e.g., lines 5-6 , page 4), wherein the polyester is prepared from:
  - i) a polyacid constituent comprising from 81 to 100% mole of isophthalic acid (IPA) (see e.g., lines 7-8 , page 4);, and
  - ii) a polyol constituent comprising from 15 to 65% mole of one or more linear chain aliphatic C<sub>4</sub>-C<sub>16</sub> diol, and from 35 to 85% mole of neopentyl glycol (NPG) (see e.g., lines 9-10 , page 4) ; and

b) a cross-linking agent comprising at least two  $\beta$ -hydroxyalkylamide groups (see e.g., lines 7-8, page 6), wherein said powdered thermosetting composition does not contain semi-crystalline polyesters; wherein the polyester is from 50 to 98 weight % of the total (see e.g., line 4, page 7); and wherein the  $\beta$ -hydroxyalkylamide cross-linking agent is from 1 to 10 weight % of the total (see e.g., line 20, page 6 and line 5, page 7).

## **VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

Claims 29 through 41 were rejected under 35 U.S.C. §103(a) for obviousness predicated upon U.S. patent No. 5,889,126 issued to Kaplan et al. (“Kaplan”) in view of Moens et al. (WO 98/18862), which is equivalent to U.S. patent No. 6,635,721 (“Moens”).<sup>1</sup>

## **VII. ARGUMENT**

### **A. GROUPING OF CLAIMS**

For the convenience of the Honorable Board of Patent Appeals and Interferences (“Board”), Appellants do not separately argue the patentability of any dependent claim. Instead, the patentability of all dependent claims stands or falls with independent claim 29.

### **B. INDISPUTABLE FACTS**

Appellants offer the following factual findings which are supported by evidence of record and not disputed.

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<sup>1</sup> For convenience all cited portions refer to the U.S. equivalent (Moens).

1. At the time the invention was made, it was known in the art that isophthalic acid-rich amorphous polyesters result in powder coatings having poor flexibility and mediocre mechanical properties. Moens, column 19, lines 10 through 16; Moens Declaration (Exhibit A), ¶ 4.

2. At the time the invention was made, it was known in the art that powders composed of an amorphous polyester, prepared from isophthalic acid and neopentyl glycol, have problems with respect to orange peel and lack of flexibility. Moens Declaration (Exhibit A), ¶ 4; published application US 2006/0217520 (the “520 Application”), Example 16 of Table 2.

3. The claimed compositions provide coatings with outstanding degassing properties and, furthermore, very smooth coatings exhibiting good outdoor durability and flexibility, without any defects possibly originated from volatile compounds (“520 Application”, ¶ [0017]). The claimed compositions provide coatings with good flexibility, outstanding flow and gloss, and remarkable weatherability (“520 Application”, ¶ [0084], Exhibit A, ¶ 4), without the need for semicrystalline polymers, by strategically employing a specific selection of polyols (Exhibit A, ¶ 5). These results would have been unexpected in view of the cited prior art. Exhibit A, ¶ 12.

4. Moens teaches away from the claimed invention. Exhibit A, ¶ 8; Moens, column 19, lines 10 through 16, Examples 31 and 32, Table II.

### **C. THE PRESENT INVENTION**

The present invention proceeds against conventional wisdom which considered amorphous polyesters rich in isophthalic acid to give powder coatings with mediocre mechanical properties. Contrary to this conventional wisdom, and quite unexpectedly, the present invention provides isophthalic acid-rich amorphous polyesters which exhibit outstanding degassing properties, outstanding weatherability, and improved flexibility, by strategically incorporating a

specific selection of polyols (component ii of the claimed invention; Exhibit A, ¶ 5). That Appellants proceeded contrary to accepted wisdom in the art constitutes “strong evidence of unobviousness.” *In re Hedges*, 783 F.2d 1038, 1041 (Fed. Cir. 1986), quoting *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552, 220 USPQ 303, 312 (Fed.Cir.1983), cert. denied, --- U.S. ---, 105 S.Ct. 172, 83 L.Ed.2d 107 (1984), citing *United States v. Adams*, 383 U.S. 39, 86 S.Ct. 708, 15 L.Ed.2d 572 (1966).

#### D. THERE IS NO *PRIMA FACIE* CASE

Prior to the most recent amendment, independent claim 29 did not include a recitation on the amount of cross-linking agent (last two lines of current claim 29). For reasons which should be apparent from the following argument, Appellants strenuously submit that the main issue on appeal pivots about the lack of a *prima facie* case with respect to claim 29 prior to the amendment inserting the amount of cross-linking agent. Accordingly, even absent the cross-linking agent weight recitation in the ultimate two lines of claim 29, the subject matter of claim 29 as a whole would not have been obvious to one having ordinary skill in the art.

Specifically, the claimed invention is directed to a powdered thermosetting composition containing (a) a carboxyl functional **amorphous** polyester prepared from (i) a polyacid comprising 81 to 100% mole of isophthalic acid and **(ii) a polyol constituent comprising from 15 to 65% mole of one or more linear chain aliphatic C<sub>4</sub>-C<sub>16</sub> diol, and from 35 to 85% mole of neopentyl glycol**; and (b) a cross-linking agent comprising at least two  $\beta$ -hydroxyalkylamide groups. **Claim 29 excludes semi-crystalline polyesters.** No such composition is disclosed or suggested by the primary reference to Kaplan as asserted by the Examiner.

In order to arrive at a composition resembling claim 29 (again without the weight recitation of the cross-linking agent), the Examiner has carefully maneuvered through Kaplan, guided by Appellants' disclosure, and selected the amorphous polyester, excluded the semi-crystalline polyester, selected isophthalic acid in the amount of 81 to 100% mole, and then, somehow, selected neopentyl glycol among many disclosed polyols, and then, presumably based upon the catchall expression "and/or" appearing in column 4, line 52, managed to inject one or more linear chain aliphatic C<sub>4</sub>-C<sub>16</sub> diols, at the relative percentages of diol and neopentyl glycol specified in claim 29 for component (ii).

Appellants submit that, even considering Kaplan in a vacuum, in complete disregard for the real world environment and the indisputable facts of record, one having ordinary skill in the art would not have been led to select an amorphous polyester derived from a high isophthalic acid concentration, let alone with a **mixture of specific polyols** (component ii) as specified in claim 29. This is because Kaplan is utterly devoid of any guidance to arrive at a composition remotely resembling that defined in independent claim 29, from among countless possible combinations. That "Kaplan's disclosure does not preclude the composition of Claim 29" as asserted by the Examiner (fourth ¶, page 5 of the October 22, 2010 Office Action) begs the question of obviousness. *In re Baird*, 16 F.3d 380 (Fed. Cir. 1994); *In re Jones*, 958 F.2d 347 (Fed. Cir. 1992).

Appellants note that, in Kaplan's EXAMPLE 3, an acid value of 33 mg KOH/g is disclosed. However, EXAMPLE 3 is incomplete as apparent from the second line thereunder, wherein the identity of a component is conspicuously omitted. Accordingly, to whatever extent the Examiner has relied on Kaplan's EXAMPLE 3, the rejection is further flawed.

Moreover, the claimed invention was not made in a vacuum, but in the real world confronting conventional wisdom. In this art, conventional wisdom taught that isophthalic acid rich polyesters result in powder coatings exhibiting poor mechanical properties. Moens, column 19, lines 10 through 16; Exhibit A, ¶4. Manifestly, one having ordinary skill in the real world would not have been led to formulate a composition containing an amorphous polyester with high isophthalic acid content from Kaplan's disclosure, knowing that the resulting coating would exhibit poor mechanical properties. Established conventional wisdom in the art cannot be ignored on the nonobviousness issue.<sup>2</sup> Appellants proceeded **contrary to conventional wisdom**, thereby underscoring the nonobviousness of the claimed subject matter as a whole. *In re Hedges, supra*; *W.L. Gore & Assoc., Inc. v. Garlock, Inc., supra*.

Moreover, it is clear that the Examiner's "secondary reference" to Moens teaches away from the claimed invention by disparaging isophthalic acid rich amorphous polyesters because they result in powder coatings having poor mechanical properties. Exhibit A, ¶ 8; Moens, column 19, lines 10 through 16, Examples 31 and 32, Table II. Such a clear teaching away from the claimed invention also constitutes strong evidence of nonobviousness. *In re Gurley*, 27 F.3d 551 (Fed. Cir. 1994).

It is therefore apparent that, even without the weight recitation of the cross-linking agent set forth in the last two lines of claim 29, the Examiner did not establish a *prima facie* case of obviousness.

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<sup>2</sup> *In re Davis*, 26 F.3d 139, 1994 WL 146837 (C.A.Fed.) "To ignore this knowledge would be to "presume[] stupidity [of the artisan] rather than skill." *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed.Cir.1985). "[A]ll of the relevant teachings of the cited references must be considered in determining what they fairly teach to one having ordinary skill in the art." *In re Mercier*, 515 F.2d 1161, 1165, 185 USPQ 774, 778 (CCPA 1975); see also *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 448, 230 USPQ 416, 519 (Fed.Cir.1986) (quoting *In re Wesslau*, 353 F.2d 238, 241, 147 USPQ 391, 393 (CCPA 1965)), cert. denied, 484 U.S. 823 (1987)."

#### E. UNEXPECTED RESULTS

It is indisputable that the present invention provides coatings, from isophthalic acid rich amorphous polyesters, exhibiting outstanding degassing properties, outstanding weatherability, and improved flexibility. Exhibit A, ¶ 5, referring to data in the written description of the specification. Appellants specifically refer to Table 2 in the written description of the specification, Ex. 16, which contains a polyester [Crylcoat 7642] prepared from isophthalic acid and neopentyl glycol, but no linear diols, and performs unfavorably. Such data, of course, must be considered in resolving the ultimate nonobviousness issue. *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1005). Such results would have been unexpected, as reported in ¶ [0017] of the published application and Exhibit A, ¶¶ 9 and 12. The results demonstrated in the written description of the specification must be considered to be truly unexpected.*Id* at 750.

Appellants also refer to Examples 31 and 32 of Moens, which are **closer to** the claimed invention than any disclosure in Kaplan. These Examples in Moens are based on compositions containing an amorphous polyester prepared from isophthalic acid, neopentyl glycol, and a **triol** , compared with the claimed compositions containing a linear chain aliphatic **diol**, and exhibit poor performance. Against such evidence the Examiner's rejection is conspicuously mute.

Based upon the foregoing, Appellants submit that one having ordinary skill in the art would not have found the subject matter of claim 29 as a whole obvious within the meaning of 35 U.S.C. § 103, without even considering the weight recitation on the amount of cross-linking agent.



**F. THE WEIGHT RECITATION OF THE CROSS-LINKING AGENT.**

In order to arrive at the weight recitation of the cross-linking agent specified in claim 29, the Examiner resorted to Moens and concluded that one having ordinary skill in the art would have been motivated to prepare Kaplan's composition with a cross-linking agent in the amount specified in claim 29. Office Action dated October 22, 2010, page 9, ¶ 1. Appellants submit that the Examiner's reliance upon Moens is completely misplaced.

Initially, it is improper for the Examiner to laser in on that isolated teaching of Moens and to conveniently ignore the portions of Moens noted *supra* that **teach away** from the claimed invention. *In re Mercier*, 515 F.2d 1161, 1166 ((C.C.P.A. 1975). ("The relevant portions of a reference include not only those teachings which would suggest particular aspects of an invention to one having ordinary skill in the art, but also those teachings which would lead such a person away from the claimed invention. See *In re Lunsford*, 357 F.2d 380, 53 CCPA 986 (1966).") As previously noted, Moens teaches away from isophthalic acid rich amorphous polyesters because of their poor mechanical properties. (Column 19, lines 10 through 16.)

Secondly, the amount of cross-linking agent disclosed by Moens is inextricably linked to a composition containing **both amorphous and semi-crystalline polyesters**, not to a composition containing an amorphous polyester which **excludes semi-crystalline polyesters** as does the claimed invention. The Examiner did not explain **why** one having ordinary skill in the art would have improperly assumed (and assumptions cannot support the ultimate legal conclusion of obviousness) that what Moens discloses with respect to a composition comprising both an amorphous and semi-crystalline polyester automatically applies to a composition containing an amorphous polyester that excludes a semi-crystalline polyester.

The bottom line is that the Examiner did not establish the requisite motivation to arrive at a powdered thermosetting composition comprising a carboxyl functional amorphous polyester prepared from 81 to 100 mole percent isophthalic acid and the specific combination of polyols recited in component (ii) of the claimed invention, let alone to employ the cross-linking agent in the amount specified. Moreover, upon giving due consideration to the objective evidence of nonobviousness of record discussed *supra*., particularly (1) the clear teaching away from the claimed invention by the Examiner's "secondary reference", and (2) the Moens Declaration, where declarant is the first listed inventor of the Moens reference, the conclusion appears inescapable that one having ordinary skill in the art would not have found the claimed subject matter as a whole obvious within the meaning of 35 U.S.C. § 103. *In re Piasecki*, 745 F.2d 1468 (Fed. Cir. 1984). Appellants, therefore, submit that the Examiner's rejection of claims 29 through 41 under 35 U.S.C. § 103(a) for obviousness predicated upon Kaplan in view of Moens is not factually or legally viable.

#### **VIII. CONCLUSION AND PRAYER FOR RELIEF**

Based on the foregoing, it is apparent that the Examiner's rejection under 35 U.S.C. §103(a) is not factually or legally viable. Appellants therefore solicit the Honorable Board to reverse the Examiner's rejection of the appealed claims.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 504213 and please credit any excess fees to such deposit account.

Respectfully Submitted,

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February 17, 2011  
Date

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**IX. CLAIMS APPENDIX**

1. - 28. (Canceled)

29. A powdered thermosetting composition comprising:

a) a carboxyl functional amorphous polyester having an acid number from 12 to 34 mg KOH/g, wherein the polyester is prepared from:

i) a polyacid constituent comprising from 81 to 100% mole of isophthalic acid (IPA);  
and

ii) a polyol constituent comprising from 15 to 65% mole of one or more linear chain aliphatic C<sub>4</sub>-C<sub>16</sub> diol, and from 35 to 85% mole of neopentyl glycol (NPG); and

b) a cross-linking agent comprising at least two β-hydroxyalkylamide groups, wherein said powdered thermosetting composition does not contain semi-crystalline polyesters; wherein the polyester is from 50 to 98 weight % of the total; and wherein the β-hydroxyalkylamide cross-linking agent is from 1 to 10 weight % of the total.

30. A powdered thermosetting composition according to claim 29, wherein the polyacid constituent optionally further comprises from 0 to 19% mole of a different aliphatic, cycloaliphatic, or aromatic polyacid chosen from: fumaric acid, maleic acid, phthalic acid, terephthalic acid (TPA), 1,4-cyclohexanedicarboxylic acid (1,4-CHDCA), 1,3-CHDCA, 1,2-CHDCA, succinic acid, adipic acid, glutaric acid, pimelic acid, suberic acid, azelaic acid, sebacic acid, 1,12-dodecanedioic acid, trimellitic acid, pyromellitic acid, and their corresponding anhydrides.

31. A powdered thermosetting composition according to claim 29, wherein the linear chain aliphatic C<sub>4</sub>-C<sub>16</sub> diol is chosen from one or more of: 1,4-butanediol; 1,5 pentanediol; 1,6-

hexanediol; 1,7-heptanediol; 1,8-octanediol; 1,9-nonanediol; 1,10-decanediol; 1,12-dodecanediol; 1,14-tetradecanediol; 1,16-hexadecanediol; and mixtures thereof.

32. A powdered thermosetting composition according to claim 29, wherein the polyol constituent optionally further comprises from 0 to 50% mole of a different linear chain aliphatic diol and/or cycloaliphatic diol chosen from: ethylene glycol; propylene glycol; 1,4-cyclohexanedimethanol; hydrogenated Bisphenol A; and mixtures thereof.

33. A powdered thermosetting composition according to claim 32, wherein the polyol constituent optionally further comprises from 0 to 5% mole of a polyol comprising three or more hydroxyl groups chosen from: trimethylolpropane (TMP); ditrimethylolpropane; pentaerythritol; and mixtures thereof.

34. A powdered thermosetting composition according to claim 29 further comprising one or more compounds chosen from: flow control agents; degassing agents; UV light absorbers; light stabilizers; stabilizing agents; antioxidants; dyes; and pigments.

35. A powdered thermosetting composition according to claim 29, wherein the polyester exhibits:

- a) a number averaged molecular weight ( $M_n$ ) ranging from 2500 to 8600, as measured by gel permeation chromatography (GPC);
- b) a glass transition temperature ( $T_g$ ) from 40 to 80°C as measured by differential scanning calorimetry (DSC) according to ASTM D3418 with a heating gradient of 20°C per minute; and

- c) an ICI (cone/plate) viscosity according to ASTM D4287, measured at 200°C ranging from 5 to 15000 mPa.s.

36. A powdered thermosetting composition according to claim 35, wherein the composition exhibits  $M_n$  from 3300 to 7500, and  $T_g$  from 56 to 70° C.

37. A powdered thermosetting composition according to claim 29, wherein

- a) the polyacid constituent of the polyester optionally further comprises
  - i) from 0 to 19% mole of terephthalic acid and/or 1,4-cyclohexanedicarboxylic acid; and
- b) the polyol constituent of the polyester optionally further comprises
  - i) from 0 to 50% mole of ethylene glycol; and
  - ii) from 0 to 5% mole of trimethylolpropane.

38. A powdered thermosetting composition according to claim 29, wherein

- the composition optionally further comprises: c) from 0 to 10 weight % of the total of one or more of UV light absorbers, stabilizers, flow control agents, and degassing agents; and
- d) from 0 to 49 weight % of one or more pigments and/or dyes.

39. A process for coating an article comprising:

- a) applying a powdered thermosetting composition according to claim 29 to the article via an electrostatic or friction charging gun, or via a fluidized bed, thereby forming a coating on the article; and
- b) heating the coated article at a temperature from 140 to 250° C.

40. A substrate entirely or partially coated by a powdered thermosetting composition according to claim 29.

41. A substrate entirely or partially coated by the process according to claim 39.

42. (Canceled)

**X. EVIDENCE APPENDIX**

Appended hereto as Exhibit A is the Declaration of Luc Moens, executed on 13 September 2010, and made of record on 13 September 2010.



**XI. RELATED PROCEEDINGS APPENDIX**

Appellants are unaware of any related proceedings that are required to be submitted in the present Related Proceedings Appendix.